

Appl. No. 09/956,954
Amdt. dated May 3, 2005
Reply to Office Action of March 21, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please add new claim 22 as follows:

1. (canceled)
2. (previously presented): The system as in claim 21 further comprising:
a far-end noise level estimator which receives the far-end signal and generates a far-end noise level estimate based on the far-end signal; and
wherein the first noise adaptive compander further comprises an expander gain control unit for adaptively expanding the far-end signal, whereby the first noise adaptive compander further operates to adjust the amplification of low level far-end noise based on the far-end noise level estimate.
3. (previously presented): The system as in claim 21 wherein the first noise adaptive compander further operates to vary the far-end signal compression range based on a total gain derived from the near-end noise level estimate and a far-end speech level of the far-end signal.
4. (previously presented): The system as in claim 21 wherein the first noise adaptive compander further comprises:
a noise level threshold value; and
a noise adaptive gain controller (NGC) gain unit adapted to vary a far-end signal gain based on a ratio of the near-end noise level estimate and the noise level threshold value.

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5. (previously presented): The system as in claim 21 wherein the first noise adaptive compander further comprises:

a noise level threshold value; and

a noise adaptive gain controller (NGC) gain unit adapted to vary a far-end signal gain based on a ratio of the near-end noise level estimate and the noise level threshold value, wherein the far-end signal gain is between a minimum gain and a maximum gain.

6. (previously presented): The system as in claim 21 further comprising:

a far-end noise level estimator receiving the far-end signal and generating a far-end noise level estimate based on the far-end signal; and

a second noise adaptive compander comprising:

a first input for receiving the near-end signal;

a second input for receiving the far-end noise level estimate;

a first output for providing a far-end output signal; and

a compressor gain control unit, wherein the second noise adaptive compander receives the near-end signal at the first input and receives the far-end noise level estimate at the second input, the compressor gain control unit adaptively adjusting a near-end signal compression range based on the far-end noise level estimate to adaptively compress the near-end signal to compensate for noise, whereby the second noise-adaptive compander operates to adjustably amplify the near-end signal based upon the far-end noise level estimate to produce the far-end output signal at the first output.

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7. (previously presented): The system as in claim 6 wherein the second noise adaptive compander further comprises an expander gain control unit for adaptively expanding the near-end signal, and further operates to adjust the amplification of low-level near-end noise based on the near-end noise level estimate.

8. (previously presented): The system as in claim 6 wherein the second noise adaptive compander further operates to vary the near-end signal compression range based on a total gain derived from the far-end noise level estimate and a near-end speech level of the near-end signal.

9. (previously presented): The system as in claim 6 wherein the second noise adaptive compander further comprises:

a noise level threshold value; and

a noise adaptive gain controller (NGC) gain unit adapted to vary a near-end signal gain based on a ratio of the far-end noise level estimate and the noise level threshold value.

10. (previously presented): The system as in claim 6 wherein the second noise adaptive compander further comprises:

a noise level threshold value; and

a noise adaptive gain controller (NGC) gain unit adapted to vary a near-end signal gain based on a ratio of the far-end noise level estimate and the noise level threshold value, wherein the near-end signal gain is between a minimum gain and a maximum gain.

11. (previously presented): A method of compensating for noise comprising:

receiving a near-end noise level estimate of a near-end signal in a compander;

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receiving a far-end signal in the compander, the far-end signal to be adaptively amplified to compensate for noise;

adjusting a far-end signal compression range of the compander based on the near-end noise level estimate; and

amplifying a far-end signal in the far-end signal compression range.

12. (previously presented): The method as in claim 11 further comprising:

receiving a far-end noise level estimate of the far-end signal;

adjusting a far-end signal expansion range of the compander based on the far-end noise level estimate; and

varying the amplification of low level far-end noise in the far-end signal expansion range based on the far-end noise level estimate.

13. (previously presented): The method as in claim 11 further comprising varying the far-end signal compression range based on a total gain derived from the near-end noise level estimate and a far-end speech level of the far-end signal.

14. (previously presented): The method as in claim 11 further comprising:

setting a first noise threshold value; and

varying a far-end signal gain based on the near-end noise level estimate and the first noise level threshold value.

15. (previously presented): The method as in claim 11 further comprising:

setting a first noise threshold value; and

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varying a far-end signal gain based on the near-end noise level estimate and the first noise level threshold value, wherein the far-end signal gain is between a minimum gain and a maximum gain.

16. (previously presented): The method as in claim 11 further comprising:
receiving a far-end noise level estimate of a far-end signal in the compander;
receiving the near-end signal in the compander, the near-end signal to be noise adaptively amplified to compensate for noise;
adjusting a near-end signal compression range of the compander based on the far-end noise level estimate; and
amplifying a near end signal in the near-end signal compression range.

17. (previously presented): The method as in claim 16 further comprising:
adjusting a near-end signal expansion range of the compander based on the near-end noise level estimate; and
varying the amplification of low-level near-end noise in the near-end signal expansion range based on the near-end noise level estimate.

18. (previously presented): The method as in claim 16 further comprising varying the near-end signal compression range based on a total gain derived from the far-end noise level estimate and near-end speech level of the near-end signal.

19. (previously presented): The method as in claim 16 further comprising:
setting a second noise threshold value; and

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varying a near-end signal gain based on the far-end noise level estimate and the second noise level threshold value.

20. (previously presented): The method as in claim 16 further comprising:
setting a second noise threshold value; and
varying a near-end signal gain based on the far-end noise level estimate and the second noise level threshold, wherein the near-end signal gain is between a minimum gain and a maximum gain.

21. (previously presented): A system for noise compensation comprising:
a near-end noise level estimator receiving a near-end signal and generating a near-end noise level estimate based on the near-end signal; and
a first noise adaptive compander comprising:
a first input for receiving a far-end signal;
a second input for receiving the near-end noise level estimate;
a first output for producing a near-end noise compensated output signal;
and
a compressor gain control unit, wherein the first noise adaptive compander receives the far-end signal at the first input and receives the near-end noise level estimate at the second input, the compressor gain control unit adaptively adjusts a far-end signal compression range based on the near-end noise level estimate to adaptively compress the far-end signal to compensate for noise, whereby the first noise-adaptive compander operates to adjustably amplify

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the far-end signal based upon the near-end noise level estimate to produce the near-end noise compensated output signal at the first output.

22. (new): A system for noise compensation comprising:

a near-end noise level estimator receiving a near-end signal and generating a near-end noise level estimate based on the near-end signal; and

a first noise adaptive compander comprising:

a first input for receiving a far-end signal;

a second input for receiving the near-end noise level estimate;

a first output for producing a near-end noise compensated output signal;

and

a compressor gain control unit, wherein the first noise adaptive compander receives the far-end signal at the first input and receives the near-end noise level estimate at the second input, the compressor gain control unit adaptively adjusts the gain applied to a far-end signal in a compression range based on the near-end noise level estimate to adaptively compress the far-end signal to compensate for noise, whereby the first noise-adaptive compander operates to adjustably amplify the far-end signal based upon the near-end noise level estimate to produce the near-end noise compensated output signal at the first output.